

Application No. 09/774,926
Amendment dated September 2, 2005
Reply to Office Action of June 2, 2005

REMARKS

Claims 1-17 are pending in the application; the status of the claims is as follows:

Claims 5 and 7-17 are withdrawn from consideration.

Claims 1, 3, and 4 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,128,039 to Chen et al. (“Chen”).

Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of U.S. Patent No. 6,587,142 B1 to Kozlowski et al. (“Kozlowski”).

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of U.S. Patent No. 6,507,519 B1 to Collins et al. (“Collins”).

The indication, in the Office Action, that the Examiner has no objections to the drawings filed on October 16, 2002, is noted. Clarification is requested as no drawings were filed on October 16, 2002. Formal drawings were filed with the Application documents on January 31, 2001.

Claim 1 has been amended to more completely correspond to the embodiment of the invention disclosed in Fig. 7. This change does not introduce any new matter.

Claim 3 has been amended to correct an antecedent basis error due to the amending of claim 1. This change is not necessitated by the prior art, is unrelated to the patentability of the invention over the prior art, and does not introduce any new matter.

35 U.S.C. § 102(e) Rejection

The rejection of claims 1, 3, and 4 under 35 U.S.C. § 102(e) as being anticipated by Chen, is respectfully traversed based on the following.

Claim 1 includes the limitations of:

a plurality of selector circuits provided one for each column of the matrix of the pixels and each having a non-differential buffer, the selector circuits each receiving, from a plurality of pixels belonging to a corresponding column of the matrix, image signals and noise signals representing variations in sensitivity and then outputting the image signals and the noise signals alternately through the buffer; and

a correction circuit receiving the image signals and the noise signals sequentially from one selector circuit after another and correcting the image signals on a basis of the noise signals.

Thus, claim 1 requires that each selector circuit include a non-differential buffer that alternatingly outputs image signals and noise signals from each of the plurality of pixels in a corresponding column. In other words, the output from each selector circuit will be of the form: image signal from pixel i, noise signal from pixel i, image signal from pixel j, noise signal from pixel j, etc., through the non-differential buffer. An example of such a selector circuit is element 3a in Fig. 7 of the present application. As can be seen, SW1a and SW1b alternatingly provide either an image signal or a noise signal to the non-differential buffer 6.

The image signals and noise signals alternatingly output from the non-differential buffer are then fed to the correction circuit. It should be noted that because the selector circuit is not noiseless, the signals being fed to the correction circuit also include selector noise. However, because the correction circuit receives the image signals and noise signals sequentially, the correction circuit can correct the image signals based on the total noise, including both the noise from the pixel and the noise from the selector circuit. In the example shown in Fig. 7, the correction circuit 4 includes a single differential amplifier with the non-inverting input receiving the image signal and the inverting input receiving the noise signals due to the pixels and the selector circuit. In this manner, a single differential amplifier corrects the noise signals due to both the pixels and the selector circuit.

In contrast, Chen does not disclose a selector circuit having a non-differential buffer that alternately outputs image signals and noise signals from each of the plurality of pixels. In Fig. 6, as cited by the Office Action, Chen discloses a first differential amplifier 307 that receives image signals and noise signals. By applying a common mode offset V_{REFI} to the inverting input of the differential amplifier 307, the common mode offset of the column of pixels is canceled, *see* column 11, lines 10-12. Thus, the output from the differential amplifier 307 corresponds to the image signal plus the noise signal due to the selector circuit 406. Thus, Chen does not disclose a selector circuit that includes a buffer without differential amplification. Further, the differential amplifier disclosed by Chen does not output image signals and noise signals from the pixels of a corresponding column alternately. Chen does recognize that the selector circuit 406 can generate a noise signal and thus includes a second differential amplifier 413 to correct for the noise due to the selector circuit 406. Chen therefore requires two differential amplifiers, one to correct for pixel generated noise, and one to correct for selector circuit generated noise. The invention of claim 1 does not require two differential amplifiers, thereby simplifying the overall circuit configuration. For at least these reasons, the invention of claim 1 is considered to be unanticipated by Chen.

Claims 3 and 4 depend from claim 1. As claim 1 is unanticipated by Chen, claims 3 and 4 are unanticipated for at least the same reasons. Furthermore, claim 3 includes additional limitations that further distinguish Chen. Claim 3 includes the limitation, “wherein, in each selector circuit, the image signals and the noise signals are first sampled and held in the first and second holding circuits respectively, and are then alternately fed through the buffer to the correction circuit.” As noted above, this is a non-differential buffer. Chen discloses only a differential amplifier 307 in its selector circuit 406, not a non-differential buffer, and thus cannot disclose the above limitation of claim 3.

Accordingly, it is respectfully requested that the rejection of claims 1, 3, and 4 under 35 U.S.C. § 102(e) as being anticipated by Chen, be reconsidered and withdrawn.

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35 U.S.C. § 103(a) Rejections

The rejection of claim 2 under 35 U.S.C. § 103(a), as being unpatentable over Chen in view of Kozlowski, is respectfully traversed based on the following.

Claim 2 depends from claim 1. As discussed above, Chen fails to disclose or suggest several limitations of claim 1. The combination of Chen and Kozlowski similarly fails to disclose or suggest each limitation of claim 1. First, Kozlowski, like Chen, employs a differential amplifier 50 as part of its selection circuit 40, *see Fig. 4*. Thus, the combination of Chen and Kozlowski fails to disclose or suggest a selection circuit having a non-differential buffer as required by claim 1, and cannot render obvious the invention of claim 1. Furthermore, given the circuit layout of Kozlowski, the output from differential amplifier 50 will not alternate between image signals and noise signals from the plurality of pixels of a corresponding column. The combination of Chen and Kozlowski therefore fails to render obvious the invention of claim 1 for at least these two reasons. As claim 2 depends from claim 1, claim 2 is nonobvious over the combination of Chen and Kozlowski for at least the same reasons.

Accordingly, it is respectfully requested that the rejection of claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Kozlowski, be reconsidered and withdrawn.

The rejection of claim 6 under 35 U.S.C. § 103(a), as being unpatentable over Chen in view of Collins, is respectfully traversed based on the following.

Claim 6 depends from claim 1. As discussed above, Chen fails to disclose or suggest several limitations of claim 1. The combination of Chen and Collins similarly fails to disclose or suggest each limitation of claim 1. While Collins discloses a column decode multiplexer 5, it provides no detail as to any of the circuitry therein. For this reason, Collins cannot disclose or suggest a non-differential buffer, and thus the combination of Chen and Collins fails to disclose or suggest at least this limitation of

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claim 1. Furthermore, without any details of the column decode multiplexer 5, Collins cannot disclose or suggest an output that alternates between image signals and noise signals from the plurality of pixels of a corresponding column as required by claim 1. The combination of Chen and Collins therefore fails to render obvious the invention of claim 1 for at least these two reasons. As claim 6 depends from claim 1, claim 6 is nonobvious over the combination of Chen and Collins for at least the same reasons.

Accordingly, it is respectfully requested that the rejection of claim 6 under 35 U.S.C. § 103(a) as being unpatentable over Chen in view of Collins, be reconsidered and withdrawn.

CONCLUSION

In view of the foregoing, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are respectfully requested.

This Response does not increase the number of independent claims, does not increase the total number of claims, and does not present any multiple dependency claims beyond the number of claims originally paid for. Accordingly, no fee based on the number or type of claims is currently due. If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed. Any fee required for such a Petition for Extension of Time or any other fee required by this response, including any fee pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee, and not submitted herewith should be charged to Sidley Austin

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